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Research suggests why bovine TB continues to spread

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The failure of the current bovine tuberculosis (TB) eradication programme could be partly due to a parasitic worm that hinders the tests used to diagnose TB in cows, according to new research published this week.

Scientists at The Universities of Nottingham and Liverpool have discovered that a parasitic flatworm often found in cattle reduces the sensitivity of skin tests used to diagnose TB in the animals. The flatworm is called Fasciola hepatica, otherwise known as the common liver fluke.

Bovine TB is a bacterial disease that in 2011 resulted in the slaughter of approximately 25,000 cattle in England, at a cost to the country of more than £90 million. Solutions for eradicating the infection have included badger culling, but new research, published in *Nature Communications*, now suggests that the spread of the disease may also be due to problems in diagnosing it in cattle infected with the common livestock disease.

In a study of more than 3,000 dairy herds in England and Wales, scientists at Liverpool and in collaboration with Nottingham, the Agri-food and Biosciences Institute, Stormont, and University College Dublin, found that liver fluke infection reduces the effectiveness of skin tests used to diagnose bovine TB, effectively creating false negatives for TB in some.

Co-author of the research, Dr Robin Flynn, from The University of Nottingham's School of Veterinary Medicine and Science said: "We

have been very interested in the ability of Fasciola hepatica to modulate host immunity for some time and this study is a worrying example of when this occurs in nature given an estimated 70-80 per cent of dairy herds show signs of liver fluke infection demonstrates the scale of this problem."

Professor Diana Williams, from the University of Liverpool's Institute of Infection and Global Health, said: "Tests to diagnose bovine TB rely on inflammation of the skin in response to injected TB proteins, but if the animal also has liver fluke infection, this inflammation is suppressed, reducing the detection of bovine TB. This means that cattle infected with both liver fluke and bovine TB may not be identified by the current bovine TB surveillance scheme in operation in the UK."

Professor Matthew Baylis, co-author of the research from the Liverpool Institute of Infection and Global Health, said: "The potential consequences of these findings are that infected cattle can continue transmitting BTB to other cattle, to wildlife reservoirs and, if they are moved from their farm of origin, to other areas of the country. This may in part explain the continuing spread of bovine TB and the failure of the current eradication programme in the UK."

The research team suggests that this finding will help improve the future diagnosis of bovine TB and speed up eradication of the disease from the UK.

Provided by University of Liverpool